



Industry Developments and Models

SD-WAN: Guidance on WAN Transformation

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IDC OPINION

Digital transformation on the 3rd Platform continues to present unprecedented opportunities and challenges for enterprise networks and the IT professionals who operate them. Indeed, the requirements associated with cloud computing have already reverberated through datacenter networking, with software-defined networking (SDN) arising as an architectural approach that provided the network with the agility and responsiveness that it lacked previously but has come to require. Now, the focus is turning to how the WAN must change to accommodate the requirements of cloud applications and services. Fortunately, technologies such as hybrid WAN and software-defined WAN (SD-WAN) are coming to the rescue, giving enterprise IT the means to allow the WAN to meet these challenges directly. In addition:

- WAN transformation is inevitable for any enterprise meaningfully pursuing digital transformation. There is no way, for example, that your organization can cost effectively support the delivery of cloud-based applications and services – including SaaS and IaaS – on WAN architectures that were designed and built for a client-server era in which all applications were resident in enterprise datacenters.
- Your enterprise's adoption of SaaS, IaaS, and other cloud services will accelerate and heighten the need for WAN transformation. As enterprises perceive cloud-based applications and services as increasingly important to their WAN planning, they understand that architectural changes to the WAN are necessary.
- Your demand drivers for SD-WAN include not only the increased adoption of cloud services, which implies a requirement for increased WAN agility and flexibility, but also the growing cost and complexity of managing enterprise WANs, as well as the steady migration of enterprise data traffic from the enterprise branch directly to the Internet.
- Your SD-WAN business benefits can include cost-effective delivery of business applications, meeting the evolving requirements of the modern branch/remote site, accommodating SaaS and cloud-based services, and improving branch IT efficiency through automation.

IN THIS STUDY

This IDC study analyzes how digital transformation on the 3rd Platform, and especially cloud, is driving a thorough reassessment of the enterprise WAN. It provides guidance for managers of network operations teams and other network professionals, offering insights on why they must transform their WAN architectures to meet a new set of requirements.

SITUATION OVERVIEW

A strategic imperative for enterprises worldwide, digital transformation shifts an ever-increasing proportion of business online and requires flexible and agile network infrastructure that can dynamically adapt to meet changing business needs.

Cloud is a key element of the 3rd Platform, which provides the underlying foundation for digital transformation. Indeed, the requirements associated with cloud computing already have reverberated through datacenter networking, giving rise to software-defined networking and other architectural innovations designed to bring greater agility to the network. Now attention is turning to how the WAN must be modified to accommodate the dynamic requirements of the hybrid enterprise in the cloud era. In fact, the WAN is an increasingly valuable element in the realization of hybrid cloud strategies for enterprises worldwide.

To understand why your WAN must change, we need to only look at how the traffic it carries has shifted as your organization has transitioned from the 2nd Platform – characterized by relatively predictable client-server applications residing in enterprise datacenters – to the 3rd Platform, where traffic patterns have become more dynamic and less predictable. The WAN architectures and technologies that served the needs of the 2nd Platform client-server era are incapable of accommodating the 3rd Platform requirements. As such, you must give careful consideration to implementing a WAN architecture that provides the same degree of business agility, operational efficiency, and security that SDN brought to the datacenter.

Whereas all your business-critical applications formerly resided in your enterprise datacenter, where they were accessed by users at branch and remote locations, now key business applications also sit in private clouds and at the datacenters of SaaS providers, IaaS providers, and other hosting providers. What's more, users are increasingly mobile, and they access not only business applications but also a wide range of Internet-based content and services on a daily basis. Backhauling these cloud-based applications and Internet services through your organization's MPLS links back to the datacenter adds both significant cost and delay.

Indeed, as your enterprise places mission-critical (e.g., ERP/CRM and UC&C) workloads and business processes in the cloud, there is a growing need to fully integrate cloud-sourced services directly into WAN architectures to ensure cost-effective workload/application performance, availability, and security.

Unfortunately, enterprises often lack visibility into their utilization of public cloud services over the WAN. Consequently, enterprise IT organizations must first analyze the volume and nature of incoming and outgoing traffic flows to verify that new WAN architectures are warranted. It is only then that they can begin to implement changes that improve application performance and provide better end-user experience for cloud-based SaaS offerings such as Microsoft Office 365 and salesforce.com.

The move to WAN transformation increasingly involves adoption of SD-WAN solutions and technologies. However, as an architectural approach to addressing the shortcomings of the traditional enterprise WAN, SD-WAN is a relatively recent phenomenon, preceded by the existence of hybrid WANs.

For the purpose of clarity, let's define these terms. A hybrid WAN includes at least two WAN connections from each branch office, and it comprises two or more different access technologies (MPLS, broadband Internet, 3G/4G, etc.). SD-WAN leverages hybrid WAN, but it includes a centralized, application-based policy controller; analytics for application and network visibility; a secure software overlay that abstracts the underlying networks; and an optional SD-WAN forwarder (routing capability); together these technologies provide intelligent path selection across WAN links, based on the application policies defined on the controller. This means that specification and prioritization of network connectivity (MPLS, broadband Internet, 4G/LTE, etc.) can be assigned on a per-application basis.

SD-WAN business benefits can include cost-effective delivery of business applications, meeting the evolving requirements of the modern branch/remote site, accommodating SaaS and cloud-based services, and improving branch IT efficiency through automation.

Inevitability of WAN Transformation

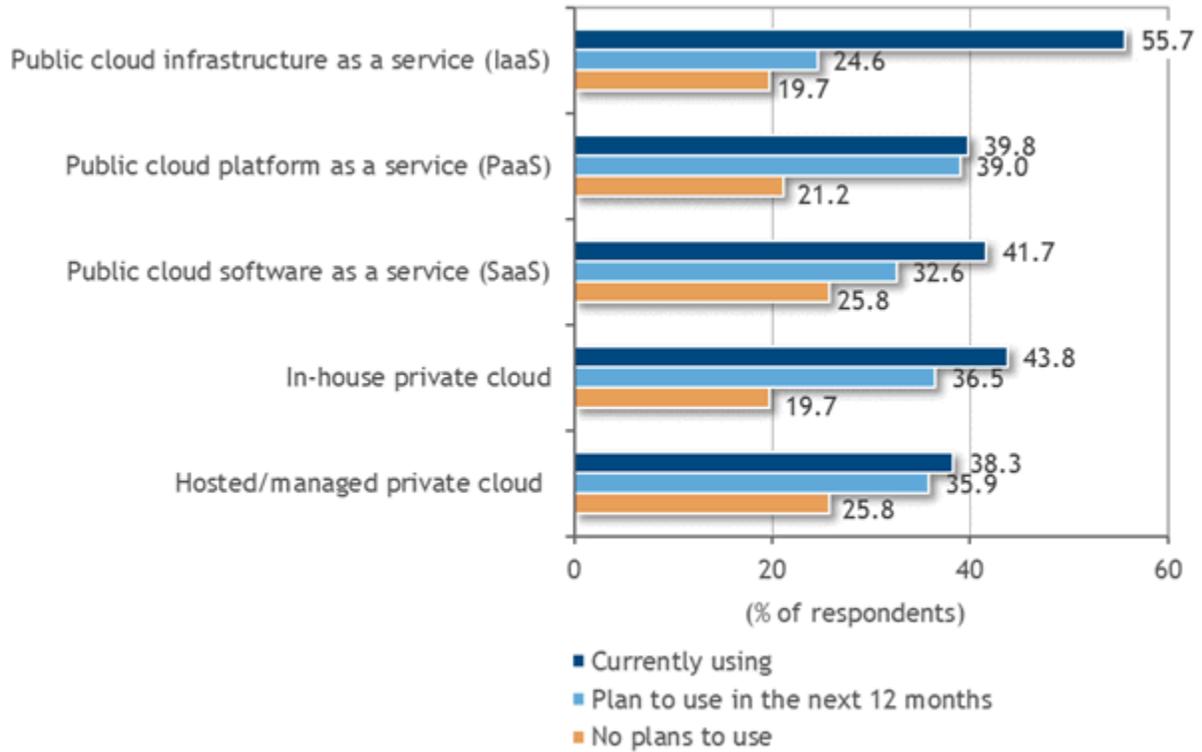
As noted, demand drivers for SD-WAN include not only the increased adoption of cloud services, which necessitate a requirement for increased WAN agility and flexibility, but also the increasing cost and complexity of managing enterprise WANs and the steady migration of enterprise data traffic from WANs to the Internet.

For most enterprises, though, the need for WAN transformation – and for architectural approaches such as SD-WAN – becomes acute as they adopt cloud services. In a recent SD-WAN survey, IDC found that most enterprise respondents are currently using or plan to use a range of cloud services, with nearly 56% indicating that they are using public IaaS, about 44% signaling the use of in-house private cloud, and nearly 42% indicating that they are using SaaS. Within 12 months, about 80% will be using IaaS and in-house private cloud to some degree, and approximately 74% will be using SaaS. About 74% say they will be using hosted/managed private cloud (see Figure 1).

FIGURE 1

Current and Future Plans of Use of Cloud Services or Resources

Q. What type(s) of cloud services or resources is your organization currently using and plans to use in the next 12 months?



n = 605

Base = all respondents

Notes:

Managed by IDC's Quantitative Research Group.

Data not weighted.

Use caution when interpreting small sample sizes.

Source: IDC's *Software-Defined WAN (SD-WAN) Survey*, April 2016

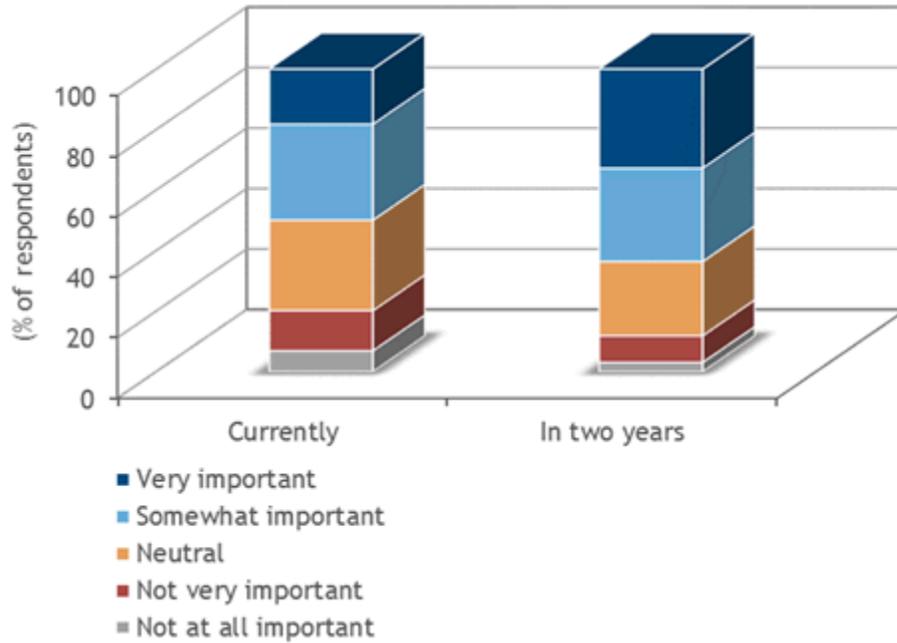
The importance of SaaS to the enterprise WAN is expected to increase sharply in the next two years. Currently, about 18% of enterprise respondents to the same SD-WAN survey indicated that SaaS was very important to their organizations' WAN technology choices. Looking ahead 12-24 months, however, nearly 33% of enterprise respondents indicated that SaaS will be very important to their organizations' WAN technology choices and planning. Those rating SaaS as somewhat important to their organizations' WAN technology choices stood at 32% currently and 31% within the next 12-24 months. All told, SaaS is very important or somewhat important to the WAN technology choices of about 50% of enterprise respondents today and to more than 63% of respondents within the next 12-24 months.

Like respondents to the IDC survey, your organization may see SaaS as an important factor affecting WAN technology choices. If your organization is adopting SaaS, you should carefully consider the implications for your WAN (see Figure 2).

FIGURE 2

Current and Planned SaaS Importance

Q. Please rate the importance of SaaS/cloud services in your organization’s WAN technology choices and planning currently and in the next 12-24 months?



n = 605

Base = all respondents

Notes:

Managed by IDC's Quantitative Research Group.

Data not weighted.

Use caution when interpreting small sample sizes.

Scale: 1 = not at all important and 5 = very important.

Source: IDC's *Software-Defined WAN (SD-WAN) Survey*, April 2016

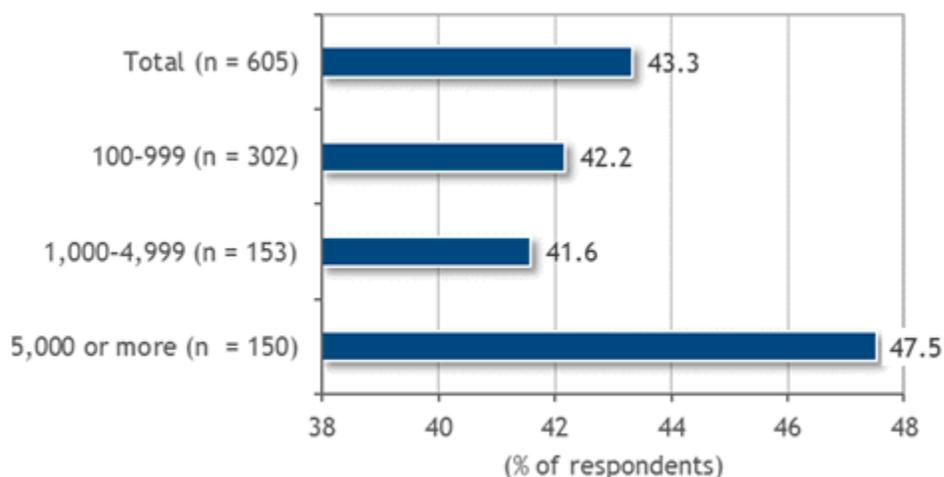
IDC survey respondents also indicated that enterprise applications are relying increasingly on the Internet for application access. For respondents in organizations with more than 5,000 employees, about 47.5% of enterprise applications are accessed using the Internet. At organizations with 1,000-4,999 employees, nearly 42% of enterprise applications are accessed using the Internet, and the percentage is nearly identical for organizations with 100-999 employees. In aggregate, respondents indicated that 43% of enterprise applications are accessed through the Internet. No matter the company size, in fact, a significant percentage of enterprise applications are being accessed via the

Internet, and this trend drives a need for a thorough rethink of how the WAN is architected and managed. (Figure 3 shows that nearly half of the enterprise apps are accessed using the Internet.)

FIGURE 3

Percentage of Current Access of Enterprise Application Using Internet

Q. What percentage of your enterprise applications are you currently accessing using the Internet?



Base = all respondents

Notes:

Managed by IDC's Quantitative Research Group.

Data not weighted.

Use caution when interpreting small sample sizes.

Source: IDC's *Software-Defined WAN (SD-WAN) Survey*, April 2016

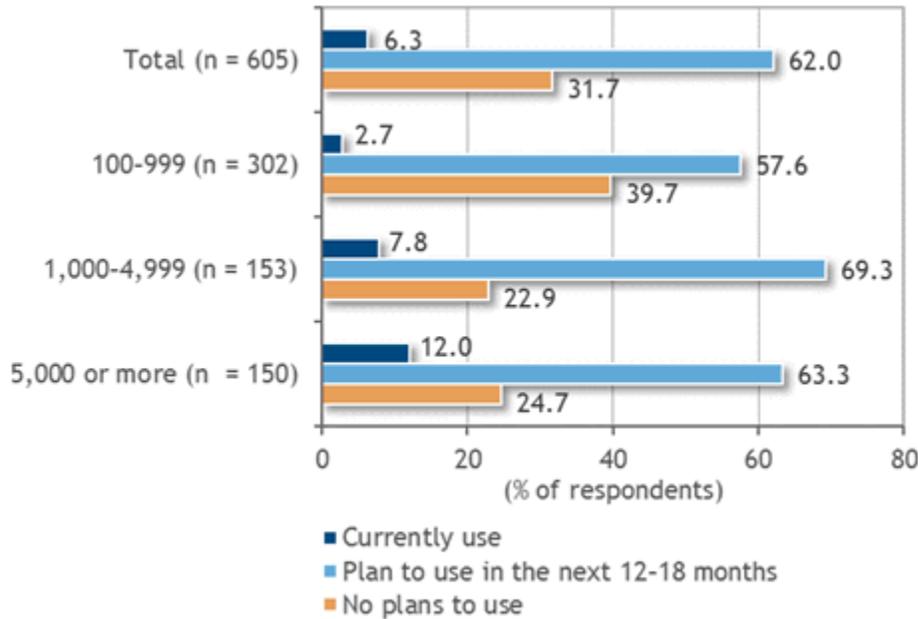
SD-WAN is a relatively nascent market, with shipping commercial offerings only first available in 2015, so the number of IDC survey respondents indicating that they currently use SD-WAN is understandably small. Only about 12% of respondents with more than 5,000 employees, for example, indicated that they were currently using SD-WAN (includes trials and POCs), and the percentages are lower at respondent organizations with fewer employees.

However, the numbers soar when respondents are asked to indicate whether they'll be using SD-WAN within the next 12-18 months. More than 69% of respondents with 1,000-4,999 employees say they will be using SD-WAN, while more than 63% of respondent organizations with more than 5,000 employees signal an intent to adopt SD-WAN. The numbers are similarly high for organizations with fewer employees, suggesting that SD-WAN is a technology that is applicable to enterprises of practically all sizes. Indeed, IDC strongly believes that SD-WAN is – or soon will be – applicable to most enterprises, regardless of size. What drives need for SD-WAN is not company size but rather the degree to which your application mix is shifting toward the cloud. (Figure 4 shows that nearly 70% expect to adopt SD-WAN within 18 months.)

FIGURE 4

Current and Planned Use of SD-WAN

Q. Does your organization currently use or plan to use SD-WAN?



Base = all respondents

Notes:

Managed by IDC's Quantitative Research Group.

Data not weighted.

Use caution when interpreting small sample sizes.

Source: IDC's *Software-Defined WAN (SD-WAN) Survey*, April 2016

Enterprises not only perceive a need for SD-WAN but also anticipate significant business value accruing from its use. Respondents to the IDC survey indicated that they foresaw mean cost savings of 19.5% deriving from SD-WAN. Approximately 38.7% of respondents expected cost savings of 11-19% from SD-WAN, whereas 32.9% of respondents anticipated savings ranging as high as 20-40%. Only about 21.5% of respondents expected their enterprises to derive cost savings of less than 10%.

Indeed, SD-WAN started gaining mindshare in 2015, and IDC predicts SD-WAN revenue will ramp up strongly in 2016 across a range of vertical markets. IDC believes that SD-WAN's value proposition – predicated on the growth of cloud computing, the need for simplified VPN capabilities, and the business imperative of reducing MPLS costs – will be compelling for a growing number of enterprise customers seeking to provide cost-effective cloud-era networking to branch offices and remote sites.

SD-WAN in Context

As with SDN in the datacenter, the rise of SD-WAN signifies far-reaching contextual changes to the role of the network in providing essential support for the application workloads critical to the success of

the enterprise. As with SDN, SD-WAN provides the network with an opportunity to go from being a perceived “cost center” to being a valuable business enabler.

Much will depend on the extent to which your IT team is willing and able to adopt technologies that are integral to SD-WAN, especially automation and orchestration. Like SDN, SD-WAN moves the operational focus away configuring network devices manually using CLI and more toward an automated, policy-based approach to application delivery across the WAN. Network operators must be willing to embrace, rather than resist, this change.

In that light, you and your IT team must consider the following questions:

- Do we, as a networking team, have a good understanding of our organization’s strategic IT priorities?
- To what degree is our organization embracing digital transformation on the 3rd Platform? If it is – and it should be – is the enterprise WAN ready to function as a critical conduit for that change?
- How is our organization’s application profile changing, and what does that mean for the WAN?
- What is our organization’s exposure to cloud-based applications, today and in the future? How will the WAN have to change to accommodate the shift?
- If our organization is a hybrid enterprise, have we adopted a hybrid WAN to accommodate its needs and to serve as a precursor to SD-WAN?
- Do we as an IT organization have a thorough understanding of what features and functionality are most important to us in an SD-WAN solution?
- If we opt for an SD-WAN solution, how will we want to deploy it – onsite as a technology solution from a vendor, as a cloud-based service from a vendor, or as a service obtained from a communications service provider (CSP) or an MSP?

FUTURE OUTLOOK

IDC believes that WAN transformation will be necessary and pervasive for most enterprises worldwide. This is particularly true for any forward-thinking enterprise-pursuing digital transformation on the 3rd Platform, and especially for those embracing cloud computing, mobility, and technologies such as IoT.

IDC posits SD-WAN as a natural progression from and a corollary to SDN in the datacenter with network virtualization slowly becoming pervasive across the enterprise. The need for automated agility and application-based policy control is extending outward from the datacenter and across the WAN to branch offices and remote sites. Both SDN and SD-WAN should be viewed as the network’s belated but necessary adaptation to the requirements spawned by 3rd Platform workloads and the primacy of the developer.

For many enterprises, perhaps including yours, the need for SD-WAN will be even greater than the need for SDN in the datacenter, especially if your application profile is migrating extensively toward public cloud services. This will be especially true for enterprises that are embracing public cloud aggressively while taking a slower approach to private cloud. For these enterprises, cost effectively and securely delivering public cloud applications to branches and remote sites takes on comparatively greater importance, even if they retain legacy client-server applications in their private datacenters.

This is why IDC has forecast that the SD-WAN market for infrastructure and services will exceed \$6 billion in 2020. What's more, for the 2015-2020 period, IDC estimates that the compound annual growth rate (CAGR) for SD-WAN will be more than 90%. As with the existing WAN deployment models, SD-WAN technology rollouts will largely be delivered through enterprise networking vendors, integrators, and communications service providers. Market surveys and customer interactions with enterprises like yours confirm that the market uptake of SD-WAN will be robust.

That said, IDC believes that SD-WAN and WAN transformation in general will be closely accompanied or followed by a fundamental overhaul of network and security services at branch offices and remote sites worldwide. Having pursued network virtualization in the datacenter and across the WAN to the edge of the branch, enterprises will look to extend automation and virtualization throughout the branch and remote sites, deploying platforms and technologies that allow for automated provisioning and remote management of WLANs, firewalls, and a range of other network and security services.

ESSENTIAL GUIDANCE

The network is essential to the success of digital transformation on the 3rd Platform. In fact, the network is more important than it has ever been to enterprise business success. As most enterprises (including yours) adopt a variety of public and private cloud services, including SaaS applications and IaaS offerings, the WAN will gain a higher profile than it has ever had previously.

This higher profile will bring greater benefits, but it will also carry greater responsibility. In all likelihood, your current WAN architectures, technologies, and best practices will not be up to the challenge of supporting your organization's digital transformation and cloud initiatives. Your current WAN will be inadequate to the task in areas such as agility, flexibility, performance, security, and – perhaps most important – cost.

As digital transformation on the 3rd Platform drives your organization to build deeper relationships with customers and to create new revenue streams based on technology-enabled products and services, it will assuredly demand more from the network, extending from the datacenter out through the campus and across the WAN to branch offices and remote sites. The watchwords will be agility, flexibility, security, and simplicity. The challenge will be for your IT team to do its job differently than before, and to architect and operate your WAN in ways that emphasize automation, programmability, and orchestration.

The sections that follow discuss the most pressing challenges.

New WAN Architecture

Your WAN will have to be re-architected so that it incorporates hybrid WAN and SD-WAN capabilities. You'll want to ensure that WAN connections from each branch office include two or more different access technologies (MPLS, broadband Internet, 4G/LTE, etc.), and you'll want to move toward a full SD-WAN capability that provides intelligent path selection across hybrid WAN links, based on per-application policy.

Direct Access to SaaS Applications

If cloud services and SaaS applications are becoming increasingly popular in your organization, you'll want to find a way for your WAN to facilitate direct connections to those services from your branch

offices. Direct cloud connectivity can boost SaaS application performance, improve quality of experience, and reduce overall costs.

Enhanced Analytics and Visibility

In an SD-WAN context, analytics and visibility take on greater importance. To establish application policies, to better understand application behavior across the WAN, and to improve hybrid network performance, you'll want to possess enhanced application and network analytics and have improved application visibility.

You'll also want to think about how the branch office of the future will be networked. SD-WAN's secure overlays can extend beyond the edge of the branch office to provide additional benefits of automated provisioning, application policy, and network virtualization throughout your branch offices and remote sites, saving additional costs, improving operational efficiency, and further boosting agility in the process. Moreover, network and security services at branch locations can be remotely provisioned and managed via an SD-WAN, either from your datacenter or through a service provided by a vendor or CSP.

Regardless of where your organization stands in its adoption of digital transformation, you can be sure that it will be an organizational imperative for years to come. If your WAN hasn't changed yet, digital transformation and cloud will soon make you cognizant of its inherent limitations. At that point, you will be seeking new architectures, new products and technologies, and a different operational mindset to accommodate and align with 3rd Platform requirements.

As always, the aim is to avoid reacting belatedly to change – after your peers and competitors already have made their moves – but instead to anticipate change beforehand and to prepare adequately for it, making proactive moves that enable your WAN to fulfill the expanded roles and responsibilities that it will assume.

LEARN MORE

Related Research

- *IDC at Interop 2016: Delivering Digital Transformation at Scale – Network Trends and Architectures* (IDC #US41308815, May 2016)
- *Riverbed Launches SteelConnect to Address the Needs of the Burgeoning SD-WAN Market* (IDC #lcUS41252116, May 2016)
- *IDC's U.S. Enterprise Communications Survey: SD-WAN Results* (IDC #US41187816, April 2016)
- *Cloud and Drive for WAN Efficiencies Power Move to SD-WAN* (IDC #US41101416, March 2016)
- *IDC PlanScape: SDN and IT Organizational Challenges* (IDC #US40713915, December 2015)

Synopsis

This IDC study examines how digital transformation and cloud computing are driving the need for significant changes to enterprise WAN architectures, and it provides guidance on how the WAN can be transformed, through adoption of technologies such as hybrid WAN and SD-WAN, to meet a new set of challenges and requirements.

“The growing enterprise adoption of SaaS, IaaS, and other cloud services will accelerate and heighten the need for significant architectural changes to the WAN. However, the need for SD-WAN is not only occasioned by the increased adoption of cloud services but also by the steady migration of enterprise data traffic from the enterprise branch directly to the Internet, and by the requirement to reduce the complexity and cost of WAN provisioning and management.” – Brad Casemore, director of research, Datacenter Networking, IDC

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